

Attorney Docket 3926.242		Patent Application
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Patent claims

1. Multi-part composite valve (1) and (4) and internal combustion engine, wherein a valve shaft (2) and a valve plate (4) are separately produced and joined to each other in an overlap area (6) thereby characterized, that the valve shaft (2) in the transition area (6) is provided at least partially with at least one intermediate layer (8), which is bonded both to the valve shaft (2) and the valve plate (4) material-to-material in the manner of chemical bond and that to the valve plate (4) is cast on to the valve shaft (2).
2. Valve equipment according to Claim 1, thereby characterized, that the intermediate layer (8) is in the form of a gradient layer (10) or multi-strata layer (12).
3. Valve equipment Claim 1 or 2, thereby characterized, that the valve shaft (2) in the overlap area (6) exhibits macroscopic undercuts or recesses (14).
4. Valve equipment one of the Claims 1 through 3, thereby characterized, that the valve shaft (2) is mechanically or chemically roughened in the overlap area (6) for formation of microscopic undercuts or recesses (14).
5. Valve equipment according to one of the preceding claims thereby characterized, that the intermediate layer or a chemical precursor layer is situated upon the overlap area (6) of the valve shaft (2) prior to the casting on of the valve plate.
6. Valve equipment according to one of the preceding claims thereby characterized, that the valve plate (4) is comprised of an aluminum-titanium compound.
7. Valve equipment according to one of the preceding claims thereby characterized, that the valve shaft (2) is comprised of a steel-material.
8. Valve equipment according to one of the preceding claims thereby characterized, that the at least one intermediate layer (8) comprises an Ag based alloy and/or Ni-based alloy and/or Ti-based alloy and/or Cu-based alloy.

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9. Valve equipment according to one of the preceding claims thereby characterized, that the at least one intermediate layer (8) is constituted on the basis of a metal oxide.

10. Valve equipment according to one of the preceding claims thereby characterized, that the intermediate layer (8) prior to casting on of the valve plate (4) exhibits an open porosity of between 1% and 75%.